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JANUARY, 1939

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## AMATEUR RADIO

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# EDITORIAL

Let us do some plain talking. It is about this Defence question. You know as well as we do that our Empire, our Ideals, our Country, our Homes are worth fighting for, we are men the same as any others, with the difference that we have a hobby that is of great value to our country and a highly efficient organisation, the W.I.A., as our mouthpiece. The Institute, way back in '29, realised the value of trained W/T Operators in a time of emergency, and after negotiation the R.A.A.F. Reserve was born. With pride you can look on that organisation as the Australian Amateur's contribution to the Defence Forces of the Commonwealth, an organisation that trains and maintains a large body of operators at small cost to the Air Force. So highly has the Wireless Reserve been thought of that it has been duplicated, in modified form to suit local conditions, in New Zealand, South Africa. Canada and the Mother Country.

But the international situation is such that none of us can rest in The Institute must again take the initiative. There are literally hundreds of patriotic Hams desirous of serving their country through their ability as operators, which the R.A.A.F. Wireless Reserve cannot cope with. The suggestion of the formation of an Australian Amateurs Emergency Corps has been received on all sides, but the time has not arrived when that may be of paramount value. That should only be our FINAL effort, not our initial one. The Army needs efficient operators in Signals, Artillery and other units, the Navy can take many also. An intensive recruiting campaign is progressing, and NOW is the time when

W.I.A. must put its shoulder to the wheel and push wholeheartedly towards the achievement of the campaign objective. Every vacancy in the Army and Navy ranks that needs an operator could be filled from the Amateur ranks, and only when we know that all three Services have all the operators that they need, let us tackle the matter of a National Emergency Corps. It will possess great value, make no mistake, but at the best it is a third line of defence. It can improve Hams' operating ability, but it cannot teach them Service Procedure; it can provide a body of men who can operate efficiently, but a body of men who will still need intensive Service training. In the preparation or the proposed national register it will be of real value for the Defence heads to know that there are the members of the Emergency Corps available for training without at first having to call on any operators from such essential services as the P.M.G. and the Railways. such an organisation will be of real value, but first let us tackle the more urgent problem. The Institute must align itself with the recruiting campaign immediately. Divisional should have Councils available for members the names of the units in which vacancies for operators exist. Members! It is up to you; do your Hobby and your Country a service that will never be forgotten. Prove that your Hobby is of such strategic value that it is deserving of every possible privilege in perpetuity.

The Editorial Committee would be pleased to receive from our various notes correspondents the date each month their section holds its monthly meeting. We intend to head our notes section with this information, as we feel that visiting members would possibly like to come to section meetings when in their respective capital cities.

#### Amateur Radio

## Switchings in the Super

(By Geo. Ryan, VK4RG.)

The line-up of the super here is as follows:-Two 6D6 r.f. amplifiers without any regeneration; 6L7 mixer with 6C6 high frequency oscillator; 6D6 intermediate amplifiers; 6B7 using one diode for detection, the other for a.v.c., while the pen-thode section is the beat oscillator; the triode section of a 75 is the first a.f. amplifier; 6A6 paraphrase push pull driver, and a pair of 2A3's in the output feeding a 12 in. speaker in an acoustic labyrinth baffle. A magic eye (6G5) is also included as well as band switching although coils for twenty and forty are the only ones to be installed so far. With this lineup the super naturally gives a good performance and has turned out to be a very satisfactory job indeed.

The switching arrangement was designed to cut out beat oscillator switches, send-receive switches, etc., as well as a few other jobs and in practice has proved to be worth its weight in gold in the way of convenience and cutting down the number of controls on the panel. A Yaxley two bank switch is used here, and in this make of switch each bank has two moving arms which move over five contacts each, thus making in all four five-position switches. In the first position of the switch the high tension is cut off; in the second, the grid of the first r.f. amplifier acts as a diode and is connected through to the audio end to make a monitor for phone work; in the third position the audio amplified is connected out to pick-up terminals; in the fourth position the super becomes a normal receiver with a.v.c. for phone work; in the last position the a.v.c. is shorted out and the beat oscillator cut in for c.w.

How all this is accomplished will be seen from the accompanying circuit diagrams. In the first position of the switch section one of the bank opens the centre tap of the high tension secondary and cuts off the receiver. In the second position the first section closes the centre tap and

turns on the high tension. The second section of the switch is in the positive lead to the plates and screens of the r.f., i.t., mixer, h.f. oscillator and best oscillator and in the second position is open. Th third section of the switch connects the grid of the first audio tube to the .5 meg leak and by-pass condenser in the grid of this tube acting as a diode detector. The fourth section of the switch is open since there is as yet no plate voltage on the beat oscillator.

In the third position of the switch the first, second and fourth sections of the switch make the same connections as they do in the second position, while the third section connects the a.f. amplifier to the pick-up terminals.

In the fourth position, the first section makes the same connection again; the second section connects the high tension to the r.f. and i.f. tubes; the third section connects the a.f. amplifier to the second detector diode load resistor; the fourth section shorts the beat oscillator cathode to earth and stops it oscillating. Beat oscillators usually run at low plate and screen voltages so will not be damaged when run with no bias on them as is the case when not oscillating.

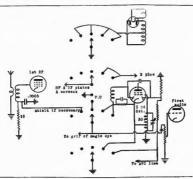
In the fifth position, sections one, two and three make the same connections as they do in the previous position. Section four removes the short on the cathode of the electroncoupled beat oscillator and instead shorts the a.v.c line to earth.

I think this about covers the switching, and if it is adapted to the particular type of super in use, no snags should be encountered, although a few remarks on the grid leak and condenser in the grid return of the first r.f. tube are perhaps called for. On the super here the a.v.c. operates on the intermediate stages only, the r.f. stages being run stages only, the r.f. stages being run

#### amateur Radio

flat out all the time for maximum signal to noise ratio. If a.v.c. were used on the r.f. stage the decoupling resistor in the a.v.c. line to this tube could be used as the load for the diode when the set is used as a monitor by making section four of the switch, when in the third position, connect the end of the resistor nearest the a.v.c. diode to earth. normal .1 by-pass on it would have to be considerably reduced in size to make it a suitable diode by-pass. How-ever I would not say it was the very best practice to use a.v.c. on the r.f. stages of a ham super-in fact I think the majority of them have regenerative r.f. stages. In the case of

A few comments on the magic eye may be of interest to the readers of "Amateur Radio" and I can certainly recommend its inclusion in any ham super. It has come to be looked upon by most hams as something they put on bcl sets to make them sell better, but I find it invaluable in many ways. Firstly it makes an excellent R meter at about half the price of an ordinary meter without any of the worry of finding the best place to put it in the circuit and making it dead beat, etc. When one becomes used to the readings it gives. quite an accurate signal strength report can be given from it. Also. it is a great help in checking up on



such regenerative r.f. stages it will of course be necessary to use a separate regeneration coil instead of taking the cathode to a tapping on the coll. Otherwise the plate current of the tube would be flowing through a .5 meg resistor! My super has ail tuning condensers ganged and it was found that the inclusion of a .0005 condenser in the first r.f. tuning circuit upset the tracking to a fairly large extent so a similar condenser was included in each tuned circuit to overcome this difficulty. Tracking should not be a source of worry on the average ham super which, I think, has one regenerative r.f. stage which is not ganged with the mixer and oscillator.

modulation. Overmodulation is indicated when the eye closes on peaks, while downward modulation is present when the eye opens on peaks. On my super the grid of the eye is connected to the moving arm of section three of the switch so that it is in operation both when the set is used as a receiver and as a monitor. When the switch is in the monitoring position the eye gives an indication of one's own modulation as well as being a useful field strength meter.

#### Monitor Your Phone

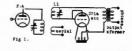
(By "The Sky Raider.")

One of the greatest problems facing the average ham to-day, is that of interference. The technical progress in the past few years had made it possible to build stables transmitters, taking up but little space in our crowded spectrum, but a necessary jeature in obtaining operating stability, in the careful adjustment of the transmitter under load, with constant monitoring. The load employed in about 99 cases out of 100, however, happens to be the most logical one, the regular antenna system. The Q.R.M. caused thereby is of serious proportions. Moreover, the widely prevalent practice of warming up the transmitter under load, and of experimenting with different arrangements, also with the transmitter loaded, contribute their full share to the present day Q.R.M. Although the method in general is highly commendable, the load employed should be a non radiating one.

Besides effecting a great saving in the wear, and tear on the vocabulary of the fraternity, the dummy has other uses. As long as your transmitter doesn't radiate, you are bound by no regulations. So if you wish to see how your transmitter will behave at such and such a frequency, or you wish to test out your phone with a gramo record, reach for your dummy antenna.

#### How a Dummy Works.

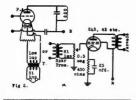
Alright, now lets see what makes the wheels go round. As far as the transmitter is concerned, the antenna system is nothing but a closed circuit containing reactance and resistance. When the antenna system is in resonance with the tank, the reactance is close to zero, and the resistance is mainly "radiation." Now, if we replace the antenna system with a closed circuit containing very nearly the same values of reactance and resistance, the transmitter will continue to oscillate merrily on, all unsuspecting. The resistors in a durmy antenna must be large enough to dissipate the R.F. power output de-



livered by the transmitter. One of the most satisfactory types of resistors for amateur work is the ordinary incandescent electric lamp. Other non-inductive resistors of sufficient power, dissipating capacity can be used.

I do not propose to go into details of a dummy antenna here, because most of you have handbooks, and quite enough information is contained therein. Besides, I would only be going over old ground: I will, however, give details of suitable phone monitoring systems I have tried at different times, and can guarantee them to work o.k. Monitoring is simple and straight-forward. The regular monitor is used in the usual way, except that it should pick up the signal from the "dummy," and

not from the tank. For average nower, bringing the monitor into proximity with the dummy probably will prove sufficient. For lower power a closer coupling may be obtained by a single wire, one end in the neighborhood of the dummy, and the other endin the vicinity of the monitor. A system of continuous monitoring is shown in Fig. 1. It is undoubtedly familiar to all, and works well. It consists of a vacuum tube linear rectifier coupled to the antenna circuit, and feeding a loud speaker or head sets through an output transformer. For average use a 201A



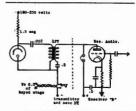
with grid, and plate tied will rectify sufficient power for head phone operation. A type 81 rectifier will provide more volume. L1 may be tuned to the tank frequency if desired.

The system in Fig 2, is excellent, and functions by picking up a small amount of audio voltage from the filiament C.T. of the final amplifler, and feeding it into a pair of phones, utilising an ordinary output transformer of the type used to feed a dynamic speaker for the purpose. Feeding the output of this monitor into a 2A5, 42 etc., a loud speaker can be used and used to full advantage.

Now then you phone hounds, roll up your sleeves, and build yourself a dummy antenna, and a monitor, you can then pump out records, etc., to your heart's content, without cluttering the air.

#### A Novel Monitor

A very simple method of coupling a conventional neon oscillator to the receiver earphones in order to monitor keying, is shown in the diagram. No relays are required, and the only switch necessary is of the ordinary toggle variety used to cut off the plate supply to the receiver whilst transmitting. Excitation voltage for the neon oscillator is supplied by tapping on the voltage divider in the receiver power pack. The keying leads from the oscillator may be connested in parallel with those running to the centre tap of the keved



stage. Should the neon bulb continue to break down when the key is up the oscillator leads to the key should be reversed.

Roger Hathaway, W1RY, of 23
Maple Street, Taunton, Mass.,
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VK's as not keeping their promise
to QSL:—2EL, 2MT, 2KB, 2AE,
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2JX, 3UJ, 3TU, 3EG, 3GQ, 4WT,
4AP, 4BB, 5SU, 5KL, 5LY, 5FM,
WJ, 5RD, 6AA, 6FO.

# Correspondence

"Willow Point" Station, Via Wentworth, (River Darling).

The Editor, Amateur Radio.

In view of the recent discussions on antennae, the "V" Beams in use here may be of some interest.

As you may guess by my location, I have to be content with QRP, using 5 watts CW and 4 fone. But I have plenty of room to put up arrays, which to a certain extent (?) minimise my handicap.

The first beam put up is directed on "W," and is quite conventional in design, having 276ft. in each leg and 35ft. high. The great difference from any other that I have heard of lies in the material used. I didn't have sufficient copper wire here, but plenty of fencing material, so tried that (14 gauge soft galvanised). Feeders are Zepp of 16 gauge enamelled copper. The results were most gratifying. I worked more W's in a fortnight than I had ever worked previously (54 in a week). worked them hours earlier than I had ever done before. The average report is one point higher than with my old Zepp (several R8), and the readability is vastly improved. The 4 watt fone has been copied in W on both 40 and 20 mx. But so far have not had a straight fone QSO with the U.S.A.

A good instance of the benefit derived is that in the Senior DX Contest I worked 17 Yanks with only two reports under QSA, 5 and up to RS.

Now the European, Asian and S. American beam is up. It is not so elaborate as the other, being only 15ft, high at the ends. I have made to 27ft, which gives a slightly better average current rise over the 20 mx band.

The gain with this was immediately noticeable. I had never been able to work an Asian before, but worked two countries there the first day it was up.

I still have to give this antenna a thorough try-out, but this morning worked I IMH, being the first European raised here in the morning, although I have tried often enough before.

The rig used is a 6V6G E.C. osc., link coupled to an 807. The 6V6G has approximately 58 volts on the plate from "B" batteries (input .6 of a watt). The 807 is powered from a vibrator (220 volts). And is plate modulated for fone use, when needed, by a 19 used Class B, driven by another 19, the two sides in cascade, transformer coupled. The modulator unit running from 185 volts B battery.

I hope the fact that fencing wire seems to be quite a good substitute for the much more expensive copper will be of some benefit to other hams.

Yours with 73, R. J. WHYTE, VK2AHM.

P.S.—Since writing the above, have worked an LU and a ZS for W.A.C. So am now more than satisfied with the two antennae.

To W.I.A., F.H.Q., Dear Om's,

Will you be good enough to publish in your official organ the following notice: The QSL Bureau of the Reseau Luxemburgeois de Amateurs d'Ondes Courtes, Luxemburg section of the I.A.R.U., has been rectying lately a great number of QSL cards from foreign Om's adressed to LX stations confirming QSO's in CW. In this country (Grand Duchy of Luxemburg) there is not one single LX station working actually in CW, and the so-called LX stations in CW which have been heard are simply foreign pirate stations having usurped LX calls.

With my very best thanks. Yours very truly,

(Sgd.) J. KESSELER, LX1A1, Secretary of the R.L. Reseau Luxembourgeois.

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Heater Voltage-Volts			6.3
Heater Current-Amps			0.9
Plate Resistance—Ohms		22	500
Mutual Conductance-uMh	08	6	000
Amp. Factor			138

Max. Plate Dissipation—Watts 21 Max. Screen Dissipation—Watts, 3.5

#### Physical Characters.

Diame				1-16	
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#### Interelectrode Capacities.

Grid to Plate, mmf.	 1.4
Input mmf	 11,5
Output mmf	11.5

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M.A.
M.A.
M.A.
45
,4
M.A.
800

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#### VK3MR's DX Notes

Season's complaints, chaps! Hope you all have recovered from the holidays. Our grumpy editor hasn't yet. Can't make it out, but he seems put out because he had to pay for his own Xmas present! (Sad tale, too.) In future these notes will be divided into phone and cw as dx on fone these days seems to be a well established art, so different from the good old "daze" when it was a thrill to work a station on cw then switch to fone! Which reminds me of ex-VK3WL who used to work HB9Q every a.m. on 7 mc., using cw. Jack asked the HB to stand by while he tried his fone, which consisted of placing a coil of a few turns in or near the grid coil of the TPTG osc. and bawling into the mike. When asked if he heard anything, the HB said, "Sure, and if you yell any louder I will be able to hear you direct?" Those WERE the days!

CW.—It seems that dx is only being worked on fone these days, judging by all the missing letters received this month! Of course, the cw man will tell you that there isn't any rare dx these times, and that he has worked it all long ago—but I don't know so much. 3KX has forsaken radio for fishing now, so no doubt we will be hearing all about the rare ones that got away owing to line gram!

Fone.—The newly appointed Western Zone President, SHG, is doing some good work on fone, using low power, and he is just another who declares that the Vee beam ant is the bee's knees! He has two of them, using three waves per leg and finds that the strength from both ends is about identical now that he has put the open ends almost horizontally. Worked 33 countries, and has only 65 verified. Has anybody been able to work CNIAF? He uses fone on 14150 kc.

A visit to a country station, 3BM, discloses some startling facts. Bruce, as is generally known, only uses

fone as he has forgotten the code (so it is rumored, although he rec-There are ants to the right of you. ants to the left, and ants all around the country; in fact, the best part of that part of the country is under copper wire! After popping a few questions. the following were gleaned:-The main stick is 120ft. 83in. high, just beating 3GV by 81in. (how could you, Bruce!) From this pole hangs 4 Vee beams k wave 7mc. doublett, k wave 80mx. ant. These are held up at the other end by 6 33ft. sticks, 2 tress and 2 60ft. masts! Including the feeders. there are 6850ft. of 4-g. copper wire! It took 2 cwt. of guy wires to defeat Nature and maintain the masts in a vertical position, and 12 gross of hd. strain insulators. That's only some of it, and more to come.

I wonder what Bruce would do if
he had to follow in the fatal footsteps of his partner in crime, 3KR, the ex-big noise of Kerang! can be rightly called the 6ITH of VK if that means anything. coverage of these ants speak for themselves, and he is mostly considered to be the loudest VK in all continents. The gain of his beam doublett. VP7NS, 14080 kc., is a newcomer, and his address is Box 374, Nasşau, Bahamas. Some of the S. American fones worked from 3BM include HK1AG, YV5AB, LU4BC who uses 2800 watts!! LU5CZ and OA4C. These are no trouble to him, although his beam seems to let him down on Brazil. These stations down in the south of VK are always very hard to contact, and mostly have that washed out sound as if they are sorry to be there.

#### SUPPORT YOUR ADVERTISERS

#### 28 and 56 M.C. Notes

(By A. Pritchard, VK3CP.)

Conditions on 10 metres seem to have passed their peak, although signals from the States are not affected in strength, but do not come through as early as the previous months. At present the signals come through at 6.30 a.m., with approximately a three day interval for that time. The Europeans are not at their best during the times around 3 p.m., and the best time for contact is after midnight. At 3BQ, G6WT was r8 on phone at 12.30 a.m. on Saturday, 17th, contacting W's. VK3IW is working most of the DX in VK3, some of the best being PY2AK, XZ2EX and contacts with K6BNR, as late as 9 p.m. keen Bern. on 10 mx. PK2WL is a new station. and gives us excellent phone. rlo has a 42 in the co, 802 doub. 10 3 T final with 75 watts input and modulated by Class B 46's. The an-

tenna is a big Zepp working on the 8th harmonic. The 2 full waves long Zepp makes a good general coverage antenna for 10, and takes a lot of beating for a receiving antenna on 5 and 10. VK3CZ is rebuilding for the last time (hi!), and has the gear all ready for wiring. The outfit has three long shelves one above the The bottom carries 6 power supplies, the middle the modulator and bias, and the top all the RF The modulator has a D104 xtal mike into a 57, 2a6, 56, PP2a3's into Class B 809's. The RF section has a 2a5 co 40x, 807 doub., 809 buffer and PP 800's in the final. The final tank condenser is the disc type Eddystone recommended by VK2GU in his article in "A.R.," "Power in his article in "A.R.," "Power Tuning Condensers for Ten and Five," October, 1938. When on 5 mx Arthur will use a 20 mx xtal and



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the same line up. By next month 3CZ should be busting the ether!! VK3BQ and 3YP (yes, he is coming back soon) have improved their Teceiver with the 1851 tubes in the rf stage, with remarkable increase in signal strength against noise. Sunday, 18th, at 9 a.m., W1CND was contacted here, and his line-up should be of interest. The antenna has a reflector director with matching feeders system with 56in. in each leg of the Y and two directors, giving us r9 signals when all others on the band were r4. The RF section has a 6L6 co, RK 25 doub., RK 25 buff., 2RK 47's and a final with 2 HF300's. The modulator has 6c5, 6N7, 2 6c5, 4 2a5's PPP driving another pair of HF300's in Class B. Increasing their power input from 400 to 800 watts only took the 1r quick fade out of the signal. The formulae given in last month's notes for the ref. dipole dir. beam was used here at 3CP in constructing that type of beam, and the results are all that could be desired for a beam, giving tremendous gain in the desired direction and reducing the local signals to r3. It seems to be good on the receiver also on 5, giving 3VA in Elwood r7 signals here, from his excellent xtal controlled carrier. VK3YL has perfect 5 metre signals and Austine uses xizi controlled output, the line up being 6L6 from 80 mx xtal, 6L6G doubling to 10mx, 809 reg. doub. final, modulated by a pair of 6L6 tubes (Efficient doubling to metres, 3CP, Nov. 37, A.R.) The above mentioned doubling circuit is in operation here at 3CP, using one of the new Taylor T40 tubes. feed back requirements are much smaller than required for 801's or similar tubes, so that an extra con-denser across the grid tank may be necessary. The T40 dips at resonance from 400 mills to 40 with a half-inch are off the tank. coupling, 1 turn, is used to the antenna tank which has 6 turns 2in. diam, well spaced and loading the doubler to its rated 115 mills.; Class B 801's are used as modulators. There are many perfect xtal controlled signals on 5 now, so that there is every reason to expect interstate contacts if conditions are suitable and the few remaining ac hashwobulators do not spoil the chance.

Talking of 10 mx, the only interstate VK's heard here this last month are VK43P's r8 phone; 4HR r8 cw.; 3ZD, 3SG and 3EX are new to 10, and doing very well. The lastnamed is using a single 210 in the final, and his cw signals are fb. Don't forget, chaps, notes before the 18th.

#### Federal and Victorian QSL Bureau

(R. E. Jones, VK3RJ, Qsl Manages)

OZ4LM, Sv Funck, Lange pr. Martofte, Denmark, loudly bewaits the lack of qsis from VK and ZL, particularly VK2ADE, VK2CC and ZL1FT.

A mast 50ft. of 3 x 3 Oregon, painted and with base, boils and gres was to be had for the taking down and carting away from VK30V. Before his generous offer could be published the recent cyclonic winds brought down the mast and wrecked it.

Cards from OK2PY state that his was the sole OK call used in the recent VK-ZL test, as all other OK stations were closed by the military authorities. In an arrogant propaganda letter he states his was the only station in Sudstenland, and that of 400 amateurs in Czecho only 7 Germans were able to obtain licences. He states that in all probability, Hans and Fritz, OK2OP and OK2OM may never again be heard on the air.

Bill Holland, VK9BW, WAU, New Guinea, has generously undertaken the distribution of cards for New Guinea.

An old station we are pleased to welcome back on the air is that of VK3FG, Fred Ince, of Caulfield.

Passing through Melbourne recently on his first seagoing trip as 2nd operator on the "Merkur" was E. Brandon, VK5FB.

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#### -Amateur Radio

VK3UX recently sustained a badly cut finger. Trust OK again now, OM.

Jack Anderson, VK3JA, visited Melbourne recently to recuperate after a successful appendix operation.

VK3JG, recently VK3KI, writes of the trials and tribulations of the North, and sends his 78 to VK3KR. John is anxious to know when Ken is going to do the deed, and looks forward to the day when he can see Ken doing a spot of pram-pushing.

Who would live in Glen Iris? Bill Shields, VK3GP, has six active hams all using their allotted power within 400 yards.

Glad to hear from an old-timer in Jeff Borden, ex-WICMX, of Touisset, Mass., U.S.A. Jeff and brother Doug have kept the astenna aloft for many a year.

Gordon Weynton, VK3XU, expects to renew old acquaintances during a trip to Adelaide over Xmas. Gordon is pleased with his score in the Junior contest, and expects to be on C.C. on 56016 ke. early in 1939.

The wily Scot from Warragul, Mac, 3XZ, writes of local goasip. Mentions that 3ZJ has gone from 3UL to 3SR to relieve for vacations. Mac and Murray, 3HZ, have been busy building field strength meters and searching for the perfect linear detector.

LYIJ and LYIS have been appointed President and Secretary respectively of the newly formed Association of Lithuanian Radio Amateurs. Tracing the growth of Amateurs in Lithuania, LYIJ mentions that there are now 45 licensed amateurs who send their good wishes to VK Amateurs.

#### Western Zone Convention

The spirit of ham radio was very much in evidence at Colac on the week-end of the 28th and 27th of November, when the first dinner and convention of the Western Zone was held. Over thirty hams were present, including the Victorian president (Mr. Gronow), several members of the Council and other metropolitan men, as well as visitors from both the Northern and Eastern Zones.

Proceedings commenced with the dinner at 6.30 p.m., and after the toasts of the W.I.A. and Western Zones, a very interesting talk was given by Mr. L. Simpson (VKSII) on his experiences in the Flying Corps during the year. This was acclaimed as the tit-bit of the convention.

Then followed the election of offace-bearers for the Zone, Mr. N. Templeton (VK3HO) being elected president, and Mr. G. Wells secretary and notes correspondent. The rest of the evening was taken up with discussion on matters of general interest.

On Sunday morning points of interest around the town were visited, including the shack of VK3KX one of VK's renowned DX men. 3JO and 3DH had a five-metre transmitter in operation on a hill near the town, and were successful in contacting one of the local stations. Most of the gang spent a lot of time scouring the district trying to locate this transmitter, but without After lunch the different success. parties began to leave for their respective homes, and a very successful convention came to a conclusion.

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#### **Divisional Notes**

To contro insertion all copy must be in the hands of the Edite not later than the 18th of the month preceding publication.

#### N.S.W. Division

#### EONE 5 NOTES.

(By VK2IG.)

Condx on most bands appear to be better for all round DX though W stations have fallen off. Some nice DX in FUS, ES and VQ2 being easy to contact.

20J.—Been pretty qrl, but on fone occasionally and going fb.

2AP.—Reckons condx not so hot as likes to keep his W skeds.

2QE.—Silent and busy.

2VK.—Had a rush trip to Albury, but has returned to his ship again. 2EU and 2QD—Still talking

about ships, but only for local work.
What about some local xmission,
O.M's.

2IG.--Still off the air; is still in hospital in VIM with his optic. Now for Waggaites.

2AEO—Been hunting up the DX. and has worked TF3C, ES, VQ2. HH, F18, FUS, K6OVN. There is a rumour he is to be transferred. He says he'll miss the cow that runs a magneto by the hour and also the H.T. interferences. Well, Poly, distant fields might look well, but might be full of thisties, hi!

2AIB.—It's also rumoured that: Allan is going to migrate, and also 2FQ. Wagga will be empty soon.

2ALD.—Had to borrow a 3-ton truck to cart his new gear back home. Has the 809 perking well, and believe he wants to sell his galloping bedstead. Sounds like auther 809 going in!
2FQ.—Been for spell to Sydney,

and as mentioned before may be leaving Wagga.

2YW.—On on Sundays, but not

heard much. Qrl YL, eh!

2MP.—Flash! Someone saw his number plate passing at 55 m.ph. Presume the rest of the crate was attached and 2MP at the wheel. Is supposed to be going 5 metres.

2GT and 2AIB.—Testing on five, and hoping something might happen.

2LM, of Leeton. — Sometimes heard with fb. fone on 40. What about that dope on ur rig you promised us, Mac.

The above applies somewhat to 2FZ, of Lemora. What's the dope,

2JL.—Does a bit on 40, but tis said he's busy rounding up grasshoppers in his spare (if any) time.

2KD and 2KQ—Very busy keeping quiet, and seemingly doing nothing pretty thoroughly. Is that right, fellers?

Also 2LL.—Ditto, repeato!!

2BW.—Going very nicely on 40. We hope he rounded up that pirate.

In regard to DE. Hams please note that VQ2MI is a consistent one and an ex-VK3, being from Cook's Point or Point Cook and Stawell. He is on Saturday nights from 11.30 to 12.30 our time, and frequency about 14375 Kc. Also two other VQ2 about then, but on 14,410 Kc. VQ2MI Qal's O.K. as 2IG has received his card.

#### ZERO BEAT RADIO CLUB NOTES.

Pursuing its policy of progressive instruction for A.O.P.C. aspirants, the Z.B.R.C. has inaugurated a system of practical demonstrations to accompany each lecture of the A.O.P.C. syllabus. This method both enlightens and interests the listener and imparts a better understanding on the subject.

#### Amateus Radia

A library has been in existence for some months and provides source of information for A.O.P.C. candidate and ham

Morse practice is conducted every Friday night from 7 p.m. to 7.45

An event of the month is "Ham night." which features discussions of interest to hams and members. On these occasions 2IQ and 2AFQ discussed some interesting topics. which were well received.

The 25th September saw the 18th Field Day held at Januali. transmitters were in operation -2AEE and 2AFQ, both on 3.5 mc. The searchers were required to find 2AEE first and then 2AFQ. During the afternoon 2AFQ worked 2AX on 7 mc. fone.

On the subject of field days, Z.B.R.C. welcomes all those interested, and particulars may be had from the club or by contacting any of its ham members.

Morse practice and club news is transmitted from club's transmitter. VK2ZB every Friday night from 7.15-7.45 p.m., frequency being 7120

A new receiver is under construction for the club, and with its completion qso's will be established with other stations.

2AEE .- Trying to get down on 56 mc. in between experimenting with portable gear.

2AFQ .- Has 56 mc, well in hand and hopes to be QRO on that band shortly.

2IQ .-- Also carrying on the good work on 5 metres with 2AFQ, Sometimes heard working W's on metres.

Both 2IQ and 2AFQ conduct Morse practice frequently on metres on Sunday mornings from 10-10.20 a.m.

2ABH.-Active on 20 metres when P.A. is not in demand.



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Page 18. 1st JANUARY, 1939.

#### Amateun Radio

2AJO—Attention centred on 40 mx fone, also transmits Morse practice for the club on Wednesday nights.

2KH.—On CW mostly; has the new rig perking well.

2AEN—Experiencing trouble with power supplies. An E.C.O. adherent.

2AIY.—Can't decide which to put in—xtal or E.C.O.

In concluding the Z.B.R.C. wishes all a Merry Xmas and Happy New Year.

#### COALFIELDS NOTES.

#### (By VK2KZ.)

VK2KE.—Nothing to report from you again, OM, but understand new year will see you active.

VK2YO.—Has just returned from a month's holiday feeling A1, leaving 14 mc and returning to 7 mc, using fone only; little to report on you, OM.

VK2KZ.—Nothing doing in radio over a month now, but will most likely be on in new year.

VK2PZ.—Working 7 mc only, waiting on 809's for a high frequency line-up; good to hear you going again, Chris, after the qrl.

VK2CW.—Working 7 mc also, busy in many ways, but trying an "R" meter on his super.

VK2KQ.—Has left 80 metres due to qrm, now on 7 mc fone; likes a good yarn any time, so give Jack a call.

VK2YL—As active as ever, using 14 and 7 mc phone and CW, also listening on 10 metres, hearing some choice DX at times. Yes. don't forget the visit, Harry.

So that's all gang as news is scarce this month. Merry Xmas to everyone and good luck.

#### WAVERLEY RADIO CLUB NOTES

#### (By 2AHJ.)

After an absence of several months, VK2BV, the club's station, is back on the air regularly. The usual wags associated with new rigs are being experienced, but these

will soon be cleared up, and the club's signal should be conspicuous on 20 and 40. The arrival and operation of the new rig has created much interest among. those members who are not yet hams, and code practices are the order of the day. Incidentally, new members, hams or otherwise, are wanted, and are invited to join in the future code lessons.

Congratulations to a new member, VK2ALC on securing his call! Grev is ex-VS4CS in Borneo, and is getting well under way with 20 mx



The New Transmitter of the Waverley Radio Club.

fone. Also a new member is Frank Burke, several years an enthusiast, and now aspiring to ham ranks.

At the weekly meeting on December 6th, a very interesting lecture was given by 2ABS, and the subject was his recent visit to Central Regional Station 2CR. Jack gave many very interesting details on the gear and power used. My! My! What cudn't we do with 10 K.W. in the antenna.

A pleasant day was spent on 4th December, when several of the members held a picnic at Harbord Beach. The best part was the sunbaking. Ask Bill Stanley — he couldn't forget it for a week.

The library is proving a very handy addition to the club. Dozens of back copies of QST's and technical booklets are kept for reference, and are available to members. Bli Stanley is doing good work as librarian.

2AFZ lately interested in 20 mx., and is hrd there at times, mostly QSO tests wid 2FU. Other times replaces C.T. resistors in P.A.

2AHJ interested in improving efficiency of rig on 20. Is usually greeted by 2ABS with such remx as "Hw"s ur no load dip?"

2AFG, having completed 3 years research on a coil winder is dividing his attentions till 1940 between dissembling rig and completing 2BV's code oscillator. Also believes in gng to bed. Fancy!

2MQ completing work on new 5 mx rig, which should soon be puttin' out.

Geo. Preece, Bob Ball and Col Paterson all at the stage where devoted parents shake heads and mutter "Cranx." Col passes hours 2nd op-ing at 2AHJ.

2TN appointed W.I.A. representative, and is quite keen on new position. Ivon also migrating to 20.

Included is a photo of the new club transmitter just after it was installed. All shelves will eventually be filled when fone is used and a QRO final is added. How about paying us a visit, you enthusiasts, and giving the rig a once-over. Believe me, there's plenty to interest you. The clubroom is rear 13 MacPherson street, Waverley, and meetings are held every Tuesday evening at 8 p.m.

## Victorian Division

Einstein to the contrary, time does not stagger back, and when you read this the season of sunburn, holidays, plum pudding, gift ties and clgars will have slipped by, and your correspondent can only belatedly wish you all the best for the New Year. May your supers all line up first try, and your transmitters put more RF into the aerial than you ever fondly hoped.

And so to business. The December Key Section meeting saw a good rally, my good self being among the late arrivals, having had to wait for MR to complete a big round-up at The old maestro's ranch. Shorthorns had made a bolt for the freedom of the range, and Snow, astride Old Faithful, the antiquarian bicycle, gave a spirited performance and eventually had the rebellious herd safely behind the rails. versatile boy, this! (Tasmanian papers please copy.) Incidentally. MR, in the company of DT, KR and one or two more of the lads, took the wrong turning on the way home from the Colac convention.

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spent some hours at that rendezvous of bathing beauties and blondes. Lorne. Accounts of what happened there are conflicting, as are also reports generally on the convention itself, but the gang can be relied on to be in all the happy fun games and undoubtedly a good time was had. Left at the barrier was DP and EB, whose car developed angina pectoris or some similar ailment, which proved impervious to either kindness or cruelty. Most of the afternoon was spent pushing the so-andso around the environs of Brunswick-but all to no avail. He just no go.

Highlight for the month for some of the cognoscenti was the visit of the flying boat "Guba" with personnel including Ray Booth, the radio op.—PK6XX to you! Your correspondent has it on the best of authority that Ray is also an ardent astronomer, and is a keen student of heavenly and celestial bodies. Melbourne should offer every advantage for a furtherance of the study although perhaps it's a bit early in the season. Apropos to this visit UM's wail for the month covers "that trip to Colac in the uncovered waggon, the NFD mosquitoes, flies and cold at Arthur's Seat, the party at OK's for PK6XX, his return picture show, and those French 75's." Nice work!

The "Guba," by the way, has absolutely the last word in aircraft radio equipment. Positively everything that opens and shuts—remote control to all parts of the ship, and when we say all parts we mean all parts! Am hoping to get a fairly full description for "Amateur Radio" in time for this issue.

Very little regarding the NFD Context to hand here. UK had a busy time preparing his portable. which included two transmitters, two aerials, two power supplies and twelve storage batteries. Shades of Mayne Nickless! However, your correspondent understands that considering the limited equipment, quite a respectable score was knocked up.

Eddystone Sales and Service Deparent, ML, has been having a great time camping with a YL from VK2. Just another of those reports about which, where, when or how we know not.

Bad luck dogged RJ, as contemplated additions have been set back by the loss of his motor bike in a bush fire at Christmas Hills. Rumor has it that the Jones bath heater could no longer take it, so in endesvouring to get rid of those unclaimed QSL's, Ray, also got rid of the bike. Shame!

Having completed a new ten tube receiver, IW found that everything except the oscillator oscillated, even the kitchen stove. Substituted the kitchen stove for the oscillator, and hey presto! everything's fine.

WAC at last-EQ.

Reports current that WG has been on. Proved unfounded.

Domini RX busy with W.I.A. classes, Italian translations and iron core IF's for crystal filter of own make. Anyone with trouble like that on his hands should be left alone. We shall do so.

Judging by some of the junk brought to the auction sale at the Key Meeting by UH, he must have found the resting place of the Ark.

A relative newcomer to 14 mc. is IK, who hopes to be doing more on that band, and will be on phone soon. Air Raider, please note!

The auction of amateur gear owned by PP was well attended by the boys, and in the prevailing excitement with true amateur spirit as much as a tenth of their value was bid for some of the choicer of-ferings. It appears that one transmitter was bught by a lad, who has since been making enquiries as to how to work it, and seemed surprised to learn that a licence was necessary. Well, well:

#### U.H.F. SECTION NOTES.

The monthly meeting of this Section took place as usual at the W.I.A. rooms on November 15th.

Meetings are held regularly on the third Tuesday in each month at the above address. Unfortunately the December meeting will be just too late in the month to be reported for the January issue of Amateur Radio. At the present time this section is deep in the design of an U.H.F. CW. transmitter for VK3WI, with a view to continuous operation, or at least fairly long operating periods with an automatic C.W. signal cuput.

The proposed arrangement so far comprises 6V5G crystal oscillator in a Tritet circuit to produce a 14 mc. output, 6L6G Doubler to 28 mc, 807 Doubler to 56 mc, and a push-pul 809 final stage. This gear would excite a vertical half wave, non-directional antenna for the time being, and for any special tests a directive beam array may be substituted.

VK3YL is heard on 56.288 mc. fairly regularly, using phone. The transmitter is crystal controlled on this frequency, and uses about 30 or so watts input to an 807 final.

VK3NB is another c.c. signal on 56.8 mc. with a good field strength.

3CP has been heard lately with a very strong signal from a regenerative doubler, final a T40 and the sig. is crystal controlled on 56.8 mc.

3OT, also c.c. on 57.172 mc., a strong consistent phone signal. 3PS, on 57,520 mc., produces a similar result from an 807 final.

The old reliable and worthy chairman of the 5 mx Section, 3JO, produces also a consistent signal on 58.3 mc. from a 6L6 final at about 25-30 watts input.

3DH is crystal controlled on 55.064 and 56.104 mc., but due to lack of antenna, or, rather, space to hang same, is not as active as might be. The final is push-push T20's with 35 watts inpush

As Christmas will have "been" by the time this reaches you, we hope everyone enjoyed a Merry and Happy both.

78 VK3DH.

#### EASTERN ZONE NOTES, (3PR-DG.)

3BR.-Jack last heard of in VIS

3DI.—Jim has bought a new car, so won't be heard on the air very often.

3DG.—On 20 mx now and again; been blowing few 6L6G's and 88's.

3HZ.—Murray is heard on 40 mx. occasionally.

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#### Amateur Radia

3IL.-Bob on occasionally between shifts.

310,—Lindsay cannot get sticks to remain intact; wind taking the tops of them.

3PR .- Going to spend Xmas and New Year rebuilding xmtr.

3QB.—How is the new rig coming along, Jack?

388.—Keith had his rig at the Maffra Show, but the tent sprung a leak. Hi. hi!

3WE.—Bill can't work any 14 mc DX with his Vee Beam, so is putting

up a rotating WSJK beam.

3XH.—Stan is putting out good
fone on 80 mx and has now cleared

up the BCL troubles.

3XZ.—Guess those pine trees have you beaten, Mac, as no sign of your sigs. yet. Hi!

#### NORTHERN ZONE.

#### (By 3ZK-3HX.)

Conditions during the past month have been very unsettled, owing mostly to storms of the dust variety with the resultant electrical interference. 80 mx seems to be holding out reasonably well, however, Yanks being heard and worked by ZL's. 40 mx. has been bad with static, and on very bad days static makes itself heard.

3TL.—With the erection of a four section 8JK beam seems to be very successful with the DX.

3BM.—Seems to have taken the title of the DX king, Bruce has added a piece to his stick in the



Some of the Hams who Attended the Colac Convention.

3GO, 3LY, 3NO.—The men who keep the Sale B Class station on the air, have no time much for ham radio; must have a full time job. Have had a new vertical ant erected at B Class, so must be getting well on with the washing.

3VG .-- Not heard of late. Where are you, o.m.?

Owing to the unfavourable conditions on 40 mx we are now holding our weekly Zone hook-ups on 80 mx on Thursday nights at 5.30 p.m. and managing to get through quite well, despite the QRN, and we would like more zone members to be on the job. vicinity of 104 feet some odd inches.

3OR.—We hope is still maintaining the OR fame. Had a visit to VIM during the month.

3JG, [ax 3KI.—Is active on 20 mx with the DX. John doesn't like supers.

3EC.—Is putting out good quality fone and has, we hope, his high frequency rig in operation.

3EP.—Has been too busy to do much lately. 3KY.—Heard on 40 mx fone:

3KY.—Heard on 40 mx fone; quality rather good.

3NN.—Not very active as far as we can ascertain, but heard on 80 mx with excellent quality fone.

3IH.—Still trying to improve on an all-wave, all-purpose, all-everything receiver while May carries on.

3ZK.—On nearly every night of the week except Friday, when he monitors the local talkie show.

3HX.—Has broken out again, and consequently not very active. More interested in broadcast programmes, hit

#### South Australian Division

(By VK5KL)

Well, here's wishing everyone a Happy New Year and a successful one for "Amateur Radio." Conditions have been quiet the last month, but DX is there at times for those energetic enough to wait for it. Ten metres fisahes its good haul of signals now and again, and those active on this band reap the benefit of good contacts from all parts of the world. More interest should be taken by DX men on this band, and so relieve the congestion on 14 mc.

Sunday nights are still popular for ragchewing on 80 mx. for a group of locals, and can be heard regularly. VK3WE has a good signal, and has been heard working duplex with a ZL.

Now that the national field day and All-Band CW contests are over, no doubt the Xmas holidays will see a great rebuilding spasm for most chaps. A good try-out should be the B.B.R.U. tests held in February.

The weather for the 5-metre test held on November 27th was not the best that could be hoped for, and consequently one of the long distant going parties did not reach their destination.

VK5GY and 5RJ were at The Hummocks, and both contacted 5HD who was on top of Mt. Lofty; R7 each way.

A novel contact was VKSLX on his yacht sailing down the Port River and at Outer Harbour. Great activity was astir in the metropolitan area, and all worked 5HD, whose signal was enormous. VK5BF, the unlucky one finished up at Black Hill, a few miles from Mt. Lofty, but nearer the Hummocks. If Frank had gone where anticipated, no doubt a new record for VK5 would have been established, well over 100 miles, but, alas, such was not the case. Another try will be made at an opportune date.

On December 21st a social Xmas Reunion was held at the club rooms, where a large attendance joined in the Xmas spirit and retold yarns of how they worked or lost that clusive DX contact. Supper was supplied by the committee in charge with refreshments. All members expressed their thanks to our worthy president, Mr. Kigariff, 53T, for donating the five-galion keg of ale. I say ale; perhaps it sounds better, but you may use your own imagination.

#### BARKER ZONE. (By VK5GW.)

Conditions have been very patchy on 40 and 20 in the South-East. A Naracoorte 40 has been fair, but no contacts have been made on 20. A few sigs. from VU, PK and KA have been coming through, but the station cannot be raised from this location.

Very little has been heard of the Mt. Gambier gang; in fact, 5CJ is only heard here on rare occasions.

5XR keeping up with fb fone on 40 and 80. Cam is building for 20 now.

5PB expects to be on early in the New Year with a complete new rig.

5GW.—Very busy; not been on the air much. Tried fone and got R3 from 5XR, which is about half a mile away. Still putting up and pulling down antennas.

Conditions for 40 metre fone are going off here.

The Murray Bridge gang are heard at R5 now instead of the usual R8-9.

Wishing you all a Merry Xmas and a Happy New Year. 73. George.

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#### WAKEFIELD ZONE. (By VK5RE.)

The draught from the doorway of life that was opened to admit the New Year has blown away the last page from the calendar of 1938, and 1939 now stands before us. A new year filled with the promise of to-morrow—may it hold at the dream ships of every amateur, and here's a wish very sincere that they sail into the shack of each and every one of you—laden with their cargoes of good fortune and good DX.

VK5LR.--Jack has been busy with a portable rig in anticipation of a well-earned holiday. Good luck, Jack, and I believe the portable is very tb.

VK5GS.—New country member of the W.I.A., Peter is getting out well with a nice xtal note.

VK5BF.—Still pounds in with a very fb sig. Congrats. on your splendid 5 mx. field day effort, Frank, O.B.

VK5LC.—Also heard putting out very nice fone.

VK5RE.—Has his 20 and 10 metre rig in rack and panel mount-

Ron Green and Nancy "going bush" for a well earned holiday. Good luck to you both; think I will stow away and come, too.

Allen Cunningham studying hard. Good work, Allen, old boy.

Harold Fisher still pleased with new car.

Merv. Tucker also busy with studies.
Well, guess this is the lot, so

cheerio! Hobby.

GREY ZONE.

Due to the poor conditions and the apparent lack of activity, and also because no one has written to me since holding this office, I cannot make complete notes of the members in this Zone.

5RJ.—Congrats., Darce, O.M., on your 5 mx. success. Very good, seeing that you rushed the building of the xmitter and receiver.

5TL.— Hear you occasionally of an early morning sked. with 5JT, Tom, but other times do not hear

5MP.—Len very active on 5 mx field day from 10 a.m. to 4 p.m., but can only report hearing, other than myself, very weak carriers who he could copy on C.W.

5YM.—On 40 mx. C.W. occasionally. The night before 5 mx field day built 56 super-regen., and was hearing 5MP in morning with few feet of inside ant. at R7.

Haven't heard the following stations for a month—5HR, 5WG, 5LG, 5WJ, 5KJ, 5NW and 5BK. Please report, chaps.

5LC.—Been busy with wheat, but active on 5 mx. field day, on top Mt. Herbert. QSO 5MP R8 both ways. Had to use 57M's super-regen. as mine would oscx. on 5 mx. QSO'd W8 on European Vee-heam, getting R8. Work it out, chaps.

Cheerio. Les.

#### Western Australian Division

(By VK6WZ)

The postponed November meeting held too late to be reported in last month's notes had as its highlight a



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lecture by Mr. Hayman, of Technical College, on thermo-plastics and synthetic resins. He spoke of bakelite and more recent developments along the line of mouldings and insulating materials. He also demonstrated a 913 oscilloscope as a wind-up to the lecture.

Conditions during November-December have been bad to fair. 14 mc. still holds the interest of the DX hounds, but is often noisy. 28 mc. showed up with a burst of fairly good conditions during the first nine days or so in December, when Eurorean Ox came through in the evenings between about 1100 and 1300 GMT. At these times European signals on fone (mostly) and c.w. (a little) were numerous, although not very strong. Contacts could be made with about the same reports at the other end. SU1MW in Cairo put an R7-8 sig. through during this period, and skeds were fixed with 6WZ. At the time of writing though a period of bad condx. is prevailing and the band is dead. Skeds are also kept (condx. permitting) with PAOFB.

6GB surprised us all by doing in a huge bank-roll on some fb new gear-T40 final, h.v. power supply, varimatch mod. tranny, 866 rectifiers. 6L6G modulators and what-have-you. Jack has been on 7 mc. a little taming the new gear.

6HT, rumour has it, now has an 809 in the final, and is working the world down on 14 me. Skip prevents us hearing him up in Perth. What's doing, Harry?

6MW is heard on 14 and 28 mc. swishing his beam round and proving its effectiveness. It certainly works.

6FL heard (fone) working 6SA (c.w.) on a recent Sunday. know what things are coming to! 6SA also heard working PAOFB in the same way (fone vs. c.w.) on 28 me. Tut. tut!

6KW puts on test programmes on Sundays with some fb transmissions.

6DF said to be on ten metres, but hasn't been heard at this QRA. How's married life, Maurie?

6ZX (ex 4LX from Brisbane) has settled in our midst, and admits being pleasantly surprised at the variety and keen prices of ham gear available in VK6. Using 6V6G. 6C6G and HY61 on 14 and 28 mc. bands on fone and c.w. Has umpteen crystals on high and low freq. ends of the bands, so should be heard somewhere or another. Has plans for a rotary beam. Greetings, Elton!

Is my face red? Last month I mentioned "6GX" as one of the new licensees on the air here. since discovered that the gentleman using that call is a pirate! Has a cobber called "6EK," who is likewise a "phoney" call. We live and learn!

Flash! 6CP, after six years, has gone crystal!! Smelling salts, please. Congrats, Clarrie-fb signal you have now.

56 mc. men should note that 6BB is putting on a special transmission on 56.744 mc. between 1300 and 1430 GMT each Wednesday and Thursday. No dope available re type of antenna to be used or power, but the transmission will be crystal controlled and music and speech will be used. Reports wanted.

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HARRY CLIFF, VK3HC.

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Harmonic QRM on 28 mc. is not confined to commercials. In VK6 many 7 and 14 mc. transmissions have hefty 28 mc. radiations, which cause no end of bother to working this band. Harmonic suppression isn't difficult, but it IS good operating, and it does show a little consideration for the other fellow. A little less use of single wire feeders tapped on to tank circuits through blocking condensers would show an improvement. Perhaps the subject could be covered in an "A.R." article in the near future?

VK4 and VK7 Notes received too late for Publication.

#### Hamads

Mayertising space in these columns is available to those wishing to sell, buy or exchange, at at per columns of the line. Minimum charge, 1/- To ensure insertion enclose postal note or stamps with copy, and address to the Advertising Manager. Annateur Radio, White Horse Road, Box Hill, Ell., Victoria.

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